AD-THEORIES

GERD LAURES

1. Ad theories and Quinn spectra

Ad theories were first introduced by Quinn in connection with bordism spectra. In his definition, an ad is given by a manifold with decomposed boundary into faces. Ads provide the simplexes of a spectrum. Later Ranicki and others saw that there are other spectra built in the same way but with algebraic data, for instance L-theory. We use an axiomatic approach to such ad theories. Our final goal will be the construction of the signature map as a map of commutative symmetric ring spectra.

2. Examples of ad theories

There are many examples of ad theories which satisfy our axioms and lead to the well known spectra: singular homology, Thom spectra, geometric and algebraic L-Theory, singular manifolds in the sense of Baas-Sullivan and in the sense of Gorski-MacPherson, L-Theory of ring spectra and so on. Also, maps originally only defined on coefficients can be written down very explicitly as maps of Quinn spectra. In the talk we will give a selection of examples.

3. Multiplicative properties of Quinn spectra

The last talk deals with product structures on Quinn spectra. If the underlying category is symmetric monoidal and the ads respect this structure then the Quinn spectrum refines to an associative symmetric ring spectrum. If in addition the category is permutative there is a refinement to a commutative ring spectrum. Some examples like algebraic symmetric Poincare complexes are not commutative initially. We will show how to fix this problem in order to achieve our final goal.